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# Emerging Allergens in Bakery Gluten-Free Ingredients - Lupine and Cricket Flour

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The "baking" aisle of the grocery store is ever evolving. No longer does the "flour section" just offer "cake," "all-purpose" and "bread" flour in bleached and unbleached forms; "gluten-free flours" are taking over a larger portion.

Gluten-free flours are those flours not derived from traditionally-grown wheat, spelt, kamut, farro, durum, barley, rye, triticale or oats. These flours are milled and ground from other types of cereal grains, nuts, legumes, tubers, vegetables and fruits. Gluten-free flours can be added to traditional wheat flour for added flavor profiles and nutrition or solely as a gluten-free flour source.

Lupine flour is a gluten-free flour that has recently appeared on American store shelves. Lupine is a legume, mostly grown in Australia and Mediterranean countries in sustainable farming systems. Lupine beans are a common snack food in many European and Asian countries and are eaten whole, boiled or dried. The beans also are milled into flour, which is highly valued for its nutritional qualities, with each bean/seed consisting of 30-40 percent protein and 4-7 percent fiber. One issue with lupine beans that both food processors and consumers need to understand is products containing lupine flour can elicit allergic reactions in susceptible people. While 90 percent of the food allergies in the United States are caused by eight foods or food groups (wheat, milk, eggs, tree nuts, peanuts, fish, soy and crustaceans), they are required to be documented on food labels. More than 160 other foods have been associated with allergies, including lupine flour. For example, lupine flour may cause allergic reactions in people who are allergic to peanuts, which are also a type of legume. This is called a cross-reaction, which occurs when the proteins in one substance (e.g. lupine) are similar to the protein in another substance (e.g. peanuts) and, thereby, elicit an allergic response.

Cricket flour also has begun appearing on store shelves and internet store sites. It is also gluten-free and desired by users for its high protein content. Cricket flour is high in protein because it is composed of ground insect parts, not predominantly starch and fiber, as are plant-based flours. However, cricket flour may cause allergic cross-reactions in individuals that are allergic to crustaceans, such as shrimp.

It is important to remember there are many symptoms associated with food allergies. Some of these may be considered minor, such as rashes and itching. However, there are also more severe symptoms, including abdominal cramps, difficulty breathing and vomiting. The most severe allergic reaction is called anaphylaxis, and it can result in constriction of airways in the lungs, seizures, suffocation by swelling of the throat, and severe lowering of blood pressure and shock. Anaphylaxis results in 30,000 emergency room visits, 2,000 hospitalizations and 150 deaths each year.

When considering whether to introduce a gluten-free flour (or any new ingredient) into a recipe or food manufacturing facility, it is important to compare any potential benefits with any potential downsides, particularly if the ingredient is an allergen. It also will be important to consider new or different practices that may need to be implemented to prevent allergen cross-contamination. Processors will need to answer questions such as: how will the ingredient need to be stored, will new sanitation practices need to be introduced and will the production schedule need to be changed?

Ultimately, the most important question to consider may be: is it possible to use an ingredient that is not an allergen to achieve the same goal? This is especially true if the product is likely to be eaten by someone who may not even know to ask if the baked good contains lupine or cricket flour.

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